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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,263	03/17/2005	Mamoru Nagao	267547US0PCT	2055
22850 7590 09/27/2007 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER YANG, JIE	
			ART UNIT 1742	PAPER NUMBER
			NOTIFICATION DATE 09/27/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/528,263	<b>Applicant(s)</b> NAGAO ET AL.	
	<b>Examiner</b> Jie Yang	<b>Art Unit</b> 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____  |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :03/17/2005, 06/17/2005, 03/08/2006, 06/05/2006, 07/05/2006, 04/30/2007, 08/16/2007.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

Regard foreign references: 10/528,263 listed in IDS marked 03/08/2005, CN 1136501 listed in IDS marked 07/05/2006, and 10/528,263, 11/754,537 listed in IDS marked 03/17/2005, they are not considered and marked out from present information disclosure statement (IDS) complying with 37 CFR 1.98 because 10/528,263 is instant application, CN 1136501 is not included and 11/754,537 is not published yet. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuroda et al (US 6,372,056 B1, thereafter '056).

Regard to claim 1, '056 teaches a spring steel which is superior in both shaving properties and green drawing properties (Abstract of JP737). The comparing composition is listed in the following table. The major composition ranges disclosed by '056 overlaps the composition ranges of the instant invention, which is a prima facie case of obviousness. SEE MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at

Art Unit: 1742

the time of the invention was made to select the claimed compositions of C, Si, Mn, P, and S from the composition disclosed by '056 because '056 discloses the same utility throughout the disclosed ranges.

Element	From instant Claim 1 (in wt%)	'056 (in wt%)	Overlapping range (in wt%)
C	0.6-1	0.38-0.85	0.6-0.85
Si	0.1-1.5	0.25-2.1	0.25-1.5
Mn	0.3-1.0	0.2-1.0	0.3-1.0
P	0.02 or less	0.035 or less	0.02 or less
S	0.02 or less	0.035 or less	0.02 or less
Claim 3			
Cr	0.3 or less (option)	0.65-1.5 (option)	--
Ni	0.3 or less (option)	0.2-0.5 (option)	0.2-0.3
Claim 4			
Nb,V,Ti,Tf,Zr	At least one: 0.1 or less	Ti: .02-.09; Nb:.02-.5	Ti:0.02-0.09; Nb:0.02-0.1
Claim 5			
N	0.01 or less	--	--
Claim 6			
Mg	0.05 or less	--	--
Al	0.01 or less	--	--
Claim 7			
B	0.001-0.005	--	--
Fe	Balance	Balance	Balance

'056 teaches 8.0 mm in diameter wire rod (Col.5, line 31-col.6, line 12 of '056) with essentially one of a pearlite structure and a combination of ferrite and pearlite structure, and has a fraction of supercooled structure less than 10% (Claim 4 and table 2 of '056). '056 further teaches a rolled spring steel superior in workability with tensile strength less

Art Unit: 1742

or equal to 1200 MPa; and reduction of area between 30% and 70% (Abstract and Fig. 1 of '056). '056 teaches the limitation of "not less than 90% of said wire rod in area percentage being composed of a pearlite structure" recited in the instant claim. '056 also overlaps with instant claim in the ranges of diameter size of wire rod, tensile strength (disclosed in table 1, 3 and 5 of instant application), and reduction of area.

Regard to equation (1) in the instant claim, the major composition ranges disclosed by '056 overlaps the composition ranges of the instant invention as discussed above. '056 teaches an alloy having a similar essentially pearlite structure as recited in the instant invention (Claim 4 and table 2 of '056). It is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D.357, 553 O.G.177; 57 USPQ 117, *Taklatwalla v. Marburg*. 620 O.G.685, 1949 C.D.77, and *In re Pilling*, 403 O.G.513, 44 F(2) 878, 1931 C.D.75. In the instant case, in the absence of evidence to the contrary, the selection of the proportions of elements of C, Mn, and Si would appear to require no more than routine investigation by those ordinary skilled in the art. (See *In re Austin, et al.*, 149 USPQ 685, 688).

'056 discloses 30 cm long test pieces (Col.6, line 13-16 of '056) is different with 4 m length recited in the instant claim. However the length of wire rod is an obvious variable for drawability test. It would have been obvious to one of ordinary skill in the art at the time the invention was made to pick suitable length, for example, 4 m wire rod to do drawability test.

'056 does not explicitly state standard deviation of tensile strength less than or equal to 30 MPa, and standard deviation of reduction of area less than or equal to 4%, however, '056 teaches measurement of standard deviation of Vickers hardness is smaller than 20, preferably less than 15 (col.4, line 1-12). The standard deviation of Vickers hardness is a substituting equivalent to standard deviation of tensile strength and standard deviation of reduction of area in sense of uniformity of microstructure of materials, and the uniform microstructure would lead to less variation of mechanical properties, for example, hardness, tensile strength, and reduction of area. Above discussion is evidenced by '056 (Col.4, line 1-12 of '056). See MPEP 2144.06.

Regard to claim 3, '056 discloses 0.2 to 0.5 weight percent Ni, which overlaps the range of 0.3 or less mass percent Ni as in the instant claim (Claim 2 of '056).



Art Unit: 1742

Regard to claim 4, '056 discloses optional adding 0.02 to 0.09 wt.% Ti, which is 0.1% or less mass percent Ti as in the instant claim (Claim 2 of '056), optional adding 0.02 to 0.5 wt.% Nb, which overlaps the range of 0.1% or less mass percent Nb as in the instant claim (Claim 2 of '056).

Regard to claims 5 and 6, the recitation "N is controlled to 0.01% or less N"; "Al and Mg are controlled to 0.05% or less and 0.01% or less, respectively" include "0" mass percent N, Al and Mg respectively. '056 does not specify wherein the alloy would contain N, Al and Mg. Therefore, '056 inherently satisfy these limitations.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over '056 in view of Tsukamoto (US 5,156,692, thereafter "692).

'056 does not explicitly states alloy for wire rod wherein the average diameter of nodules in said pearlite structure is 10  $\mu\text{m}$  or less. '692 teaches a process for manufacturing steel wires for use in wire drawing, and particularly steel wires which are subsequently subjected to final wire drawing to form steel filaments which are used in the manufacture of steel cord wires (Col.1, line 6-10). '692 teaches the resulting pearlite has a pearlite block size of not greater than 5.0  $\mu\text{m}$ , which is in the

Art Unit: 1742

range of 10  $\mu\text{m}$  or less nodules diameter of pearlite structure recited in the instant claim. '692 teaches similar composition alloy (Col.7, line 21-25 of '692), with similar fine pearlite structure (Col.3, line 16-27 of '692), for same steel wire drawing application (Col.1, line 6-10) as the instant invention. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to obtain fine pearlite grain size (or be called pearlite blocks), for example, less than 10  $\mu\text{m}$  as demonstrated in '692 in the process of '056 to improve drawability of the steel wire (Col.3, line 15-27 of '692).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over '056 in view of Bae et al (US 6,264,759 B1, thereafter '759).

'056 does not explicitly states alloy for wire rod further contain B: 0.001 to 0.005%. '759 teaches a method for manufacturing wire rods for using in making bead wires, wire ropes and spring (Abstract of '759). '759 teaches a wire rod alloy with major composition ranges (claim 1-4 of '759) overlap with the composition ranges recited in instant invention. '759 teaches B content should be preferably limited to 10-30 ppm (Col.5, line 55-64 of '759). This B composition range is in the

Art Unit: 1742

range of 0.001 to 0.005%wt. B recited in the instant claim. '795 teaches a similar composition alloy, with the similar degenerated pearlite structure for making the same high strength steel wire (Col.3, line 29 to col.4, line 26 of '759) as the instant invention. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add 0.001 to 0.005%wt. of B as disclosed by '759 in the alloy of '056 to reinforce the hardenability of the steel to inhibit the formation of ferrite (Col.3, line 51-60 of '759).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1742

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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